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VALVULAR HEART DISEASE

MULTIMODALITY IMAGING IN TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI): COMPARISON BETWEEN CARDIOVASCULAR MAGNETIC RESONANCE, CARDIAC COMPUTED TOMOGRAPHY AND ECHOCARDIOGRAPHY

ACC Poster Contributions
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Background: Patients often undergo several cardiac imaging investigations during assessment for TAVI. This study sought to determine the agreement and variability of cardiovascular magnetic resonance (CMR), ECG-gated cardiac computed tomography (CCT) and transthoracic echocardiography (TTE) in the assessment of aortic root dimensions.

Methods: TAVI patients assessed by CMR, CCT and echocardiography were recruited. Agreement and variability between each imaging modality in the measurement of aortic annulus, sinus of valsalva (SOV), sinotubular junction (STJ) and ascending aorta dimensions were assessed by Bland-Altman analysis. Intraobserver and interobserver variability were similarly assessed.

Results: Of 201 patients undergoing TAVI assessment with both CMR and TTE, 133 also had a CCT. Close agreement was observed between CMR and CCT in dimensions of the aortic annulus (-0.4 (2.7) mm; -5.7 mm to 5.0 mm, (Bias (SD of Bias), 95% Limits of agreement)), SOV (-0.6 (2.5) mm; -4.3 mm to 5.5 mm), STJ (-0.7 (2.4) mm; -5.3 mm to 3.9 mm), and ascending aorta (-0.1 (2.6) mm, -5.3 mm to 5.1 mm).

Agreement between TTE-derived measures and either CMR or CCT was less tight. CMR to TTE agreement in dimensions of the aortic annulus was (1.0 (4.7) mm; -8.3 mm to 10.4 mm), SOV (-1.0 (4.3) mm; -9.5 mm to 7.5 mm), STJ (-0.8 (4.0) mm; -8.7 mm to 7.1 mm) and ascending aorta (-0.8 (4.9) mm; -10.3 mm to 8.7 mm). Intraobserver and interobserver variability was lowest in CMR followed by CCT then TTE.

Pre-procedural imaging reported a larger annulus size than the inserted TAVI diameter in 21 cases (5 CMR, 5 CCT and 11 TTE, (all separate cases)) the size of which was ultimately governed by intra-procedural transesophageal echocardiography. In cases of imaging-TAVI size mismatch, no difference in post-operative aortic regurgitation severity was observed between imaging modalities (⊠2 = 4.5, p = 0.6).

Conclusions: In patients undergoing assessment for TAVI, close agreement exists between CMR and CCT in the assessment of aortic root dimensions. Low intraobserver and interobserver variability was seen in both modalities, although best with CMR. Lower agreement and higher variability was observed between TTE and both CCT and CMR.